Duration of Fever in Uncomplicated Measles Patients

Xenalamine Group				Placebo Group			
Case No.	Duration (Days) of Fever from Start of Treatment	Max. Temp. F.	Max. Temp. C.	Case No.	Duration (Days) of Fever from Start of Treatment	Max. Temp. F.	Max. Temp. C.
6	1	100·2	37·9	2	4	103·0	39·4
11	3	103·0	39·4	5	2	101·6	38·7
23	2	101·4	38·6	8	1	103·0	39·4
28	2	103·4	39·7	13	4	103·8	39·9
31	2	103·0	39·4	15	1	100·8	38·2
34	2	104·0	40·0	17	4	103·8	39·9
				*24	4	101·0	38·3
				25	3	101·0	38·3
				33	2	103·2	39·6
				50	4	102·4	39·1

Xenalamine group: Mean duration = 2·0 ± 0·3 days.
Placebo group: mean duration = 2·8 ± 0·4 days.
Xenalamine group: Mean max. temp. = 102·5° F. (39·17° C.).
Placebo group: Mean max. temp. = 102·4° F. (39·11° C.).
Temperatures were taken rectally: "Fever" was taken as a reading of 101° F. (38·3° C.) or over.
* This patient developed bronchopneumonia on the seventh day, after the temperature had fallen to normal.

was given in this trial. While it is possible that this may not be the best method of administration, Liu and Ferlauto (1961) found that a single daily dose of xenalamine was effective in treating experimental influenzal infections in mice.

According to earlier reports, the viraemic stage in measles probably extends from some time during the prodromal period until about 24 to 30 hours after the appearance of the rash. The children in this trial were therefore given xenalamine only when the viraemic stage was subsiding or had ended, and large numbers of cells would be infected by the virus. It is at present difficult to judge exactly how great an effect this might be likely to have on the results of treatment with xenalamine; Liu and Engle (1961), working with influenza virus, showed that there was a direct virucidal action of xenalamine *in vitro*, but felt that this was probably not its main mode of action *in vivo*, since it could also be shown that it reduced the yield of virus from cells of a CAM preparation already infected before the drug was added. If this was also true of measles virus, it might be expected that the drug, if active, would reduce the severity of the disease even if given after the viraemic stage had subsided. Under local conditions it is most unlikely that measles will be diagnosed or treated prior to the appearance of the rash: thus one is likely to require a drug which exerts a true "virustatic" effect rather than one which is active only against unabsorbed virus. It should, however, be borne in mind that our present results may not indicate the possible activity of xenalamine given prophylactically or during the prodromal period.

This trial was designed to test the efficacy of xenalamine in reducing the observed incidence of diarrhoea (63%) and respiratory complications (37%) to an incidence of 5% in both cases, and in reducing the period of conjunctivitis in 95% of patients. Under the conditions chosen for the trial, it was found that there was no significant difference between xenalamine and placebo tablets in these respects; nor did xenalamine appear to shorten or lessen the severity of pyrexia. The respiratory complications appear to be due to secondary bacterial invasion, and if treated early respond well to penicillin. It is, however, clear from our results that xenalamine given after the appearance of the rash has no influence on the development of this serious complication.

Summary

In a trial based on Armitage's method of sequential analysis no difference was found between groups of children suffering from measles who were treated either with xenalamine or with inert tablets, in respect to the incidence of complicating respiratory infections, duration of fever, duration of conjunctival injection or incidence of diarrhoea. Xenalamine was administered at a dose level of approximately 50 mg./kg./day for five days, commencing within 24 hours of the appearance of the rash.

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REFERENCES

Armitage, P. (1961). *Sequential Medical Trials*. Blackwell, Oxford.
Baldini, E., and Vaccari, F. (1961). *Gazz. int. Med. Chir.*, **66**, 310.
De Mattia, R., and Rapellini, M. (1961). *G. Mal. infett.*, **13**, 480.
Gans, B., Macnamara, F. N., Morley, D. C., Thomson, S. W., and Watt, A. (1961). *W. Afr. med. J.*, **10**, 253.
Liu, O. C., and Engle, G. C. (1961). *G. Mal. infett.*, **13**, 351.
—— and Ferlauto, R. J. (1961). Report to Naples Congress, 1961.
Magni, L. (1961). Quoted by G. Leonardi, *Recenti Progr. Med.*, 1961, **30**, 275.
Nordio, S., and Massimo, L. (1961). *G. Mal. infett.*, **13**, 492.
Rasi, F. (1961). Ibid., **13**, 498.

EFFECT OF MENSTRUATION ON SIMPLE REACTION AND MOVEMENT TIME

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The significance of the menstrual cycle in accident proneness has been discussed by Whitehead (1934) and demonstrated by Dalton (1960). The latter surveyed 124 women who were hospitalized because of accidents, and found that for a significant number of those with regular cycles the accident had occurred during menstruation or the four days prior to it. She suggested that these accidents were the result of the increased lethargy which impairs judgment and slows reaction time. Noack (1960), after a study of German sportswomen, also reported that the pre-menstrual woman is, in general, less efficient than the post-menstrual. However, Bilhuber (1927) conducted a longitudinal study of 14 women aged 17 to 22 and concluded that menstruation does not affect motor ability; Youngen (1956) found no change in the speed of arm movement or simple reaction time of 122 college women as a result of menstruation; and Bausenwein (1960) points out that many a woman athlete's best performance has been achieved during menstruation, even to the extent that records have been established and Olympic medals won.

It was the purpose of the present study to investigate the effects of the menstrual cycle on simple reaction time and movement time. A secondary consideration was the relationship of reaction time and movement time.

Method

Twenty-five nulliparous women aged 20 to 25 were measured for simple reaction time and movement time by means of an apparatus which employed two chronoscopes and was similar to that previously described by Pierson and Montoye (1958). Briefly, the apparatus consisted of a chronoscope which was activated simultaneously with a neon stimulus lamp, a microswitch which stopped the chronoscope and activated another when the subject initiated the response, and a photoelectric beam placed 11 in. (28 cm.) from the switch and whose interruption stopped the second chronoscope. The subject was instructed to respond to the stimulus by releasing the switch and extending her hand through the light beam. The response involved only the forward extension of the dominant arm. An audible preparatory signal was given from one and a half to two and a half seconds before the stimulus was presented. This is compatible with the recommendations of Klemmer (1956), who noted that the important determiner of reaction time is not the immediate foreperiod but rather the distribution of foreperiods within which it is embedded. In accordance with the recommendations of Pierson and Rasch (1959), the mean of the last five of twenty trials was used in the computations. Each subject was tested four times: two days before menstruation and two, eight, and eighteen days after its onset, and to minimize the test-to-test practice effects the order of testing was that of a modified Latin square.

The data were subjected to an analysis of variance, and no statistic was considered as significant unless its chance occurrence was 5% or less. The Pearson product-moment technique was used to test the hypothesis that reaction time and movement time are uncorrelated.

Results

The mean scores and sample standard deviations are presented in the Table. The results of the analyses of variance indicated no significant differences in the mean scores or deviations for reaction time or movement time ($F=0.57$ and 0.33, respectively). None of the correlation coefficients for reaction time and movement time was significantly different from zero ($r=0.15$, -0.11, 0.24, and 0.36 for tests A, B, C, and D respectively), nor was the difference between the two extreme coefficients significant ($z=0.50$).

Reaction Time and Movement Time (in Seconds) Before, During, and After Menstruation

Time	A		B		C		D	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Reaction ..	0·141	0·03	0·142	0·04	0·146	0·04	0·137	0·02
Movement	0·174	0·06	0·160	0·05	0·161	0·03	0·160	0·05

A=2 days prior to menstruation. B=2 days after menstruation. C=8 days after menstruation. D=18 days after menstruation.

Discussion

From the evidence it seems that women, in general, are less efficient and more accident-prone during the pre-menstrual and menstrual phases of the cycle than at other times. This does not appear to be caused by the attendant lethargy, because pharmacologically induced lethargy has been demonstrated to have no significant effect on judgment, reaction time, or visual and steadiness tests (Marquis *et al.*, 1957), and the results of the present study indicate that reaction time and movement time remain relatively constant throughout the cycle. There has long been a cultural assumption that women have a diminished efficiency during certain phases of the menstrual cycle. Although impairment of reaction time and movement time or primary mental abilities is not associated with subjective expressions of lethargy in male subjects (Pierson *et al.*, 1961 ; Brubaker and Pierson, 1962), the possibility of the aforementioned assumption having a causal effect on the accident-proneness of women cannot be discounted. A more probable reason, however, is that the discomfort and distractions peculiar to the menstrual and pre-menstrual phases cause an inattentiveness to the task at hand. The results of the present study may be considered typical of the reactions of the organism as a whole, because there is considerable evidence of a general reaction-time factor and some evidence to support the hypothesis of a general movement-time factor (Guilford, 1958 ; Pierson and Rasch, 1960).

The correlations for reaction time and movement time reported in the present study do not significantly differ from those reported by Youngen (1956) and Henry (1961) for college women ($r=0.26$ and 0.06, respectively), and by Pierson (1959) for college-age men ($r=0.35$).

Summary

Twenty-five nulliparous college women were tested for reaction time and speed of arm movement four times during the menstrual cycle: two days prior to menstruation and two, eight, and eighteen days after its onset. The analyses of the data revealed no significant changes in reaction time, speed of movement, or the relationship of the two to each other during the cycle. It is suggested that the accident-proneness and lessened efficiency generally observed during the premenstrual and menstrual phases of the cycle result from inattention due to discomfort and external distractions.

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REFERENCES

Bausenwein, I. (1960). *Sportärztl. Prax.*, **3**, 12.
Bilhuber, G. (1927). *The Effect of Functional Periodicity on the Motor Ability of Women in Sports.* Univ. of Michigan.
Brubaker, M. L., and Pierson, W. R. (1962). *J. clin. Psychol.*, **18**, 518.
Dalton, K. (1960). *Brit. med. J.*, **2**, 1425.
Guilford, J. P. (1958). *Amer. J. Psychol.*, **71**, 164.
Henry, F. M. (1961). *Res. Quart. Amer. Ass. Hlth phys. Educ.*, **32**, 353.
Klemmer, E. T. (1956). *J. exp. Psychol.*, **51**, 179.
Marquis, D. G., Kelly, E. L., Miller, J. G., Gerard, R. W., and Rapoport, A. (1957). *Ann. N.Y. Acad. Sci.*, **67**, 701.
Noack, H. (1960). *Sportärztl. Prax.*, **3**, 66.
Pierson, W. R. (1959). *Res. Quart. Amer. Ass. Hlth phys. Educ.* **30**, 227.
—— and Montoye, H. J. (1958). *J. Geront.*, **13**, 418.
—— and Rasch, P. J. (1959). *Perceptual and Motor Skills*, **9**, 107.
—— —— (1960). Ibid., **11**, 123.
—— —— and Brubaker, M. L. (1961). *Med. d. Sport (Roma)*, **1**, 61.
Whitehead, R. E. (1934). *J. aviat. Med.*, **5**, 47.
Youngen, L. J. (1956). "A Comparison of Reaction Time and Movement Time Measures of Women Athletes and Non-athletes," unpublished thesis, Michigan State Univ.